

Aerosols, Clouds, and Climate

Michael D. King
University of Colorado

Aerosol particles are produced in the earth's atmosphere through both natural as well as man-made processes, and contribute profoundly to the (i) formation and characteristics of clouds, (ii) lifetime of clouds, (iii) optical and microphysical properties of clouds, (iv) human health through effects on air quality and the size of particulates as well as vectors for transport of pathogens, (v) climate response and feedbacks, (vi) precipitation, and (vii) harmful algal blooms. Without aerosol particles in the Earth's atmosphere, there would be no fogs, no clouds, no mists, and probably no rain, as noted as far back as 1880 by Scottish physicist John Aitken. With the modern development of instrumentation, both ground-based, airborne, and satellite-based, much progress has been made in linking phenomena and processes together, and putting regional air quality characteristics and cloud response into closer scrutiny and linkages. In this presentation I will summarize the wide ranging contributions that NASA has made in ground-based (AERONET), aircraft field campaigns, and, especially, satellite remote sensing to shed new light on this broad ranging and interdisciplinary field of cloud-aerosol-precipitation interactions.